



Gemini Microcomputers Ltd News Release

Preliminary specification for the Gemini 8088 board - 12th June 1984

Overview

The GM888 is an 8"x8" 80-BUS board. It contains an Intel 8088 (also known as iAPX88) 16-bit processor together with a Real Time Clock with battery back-up and a socket for the fitting of an optional 8087 high-speed arithmetic co-processor. An 80-BUS I/O port is allocated to allow the operating system or user program to switch between using the 8088 CPU on the GM888 and the Z80A on the host CPU board.

On-board firmware is restricted to a minimal 'bootstrap' program. This approach means that the operating system is not committed to one particular choice, but may be CP/M-86, Concurrent CP/M, MS-DOS (a variant of IBM PC-DOS) or any future 8088 compatible operating system. Indeed, certain applications may not utilise any currently recognised operating system and may involve user-written routines that take advantage of the architecture of the 8088, and 8087, if fitted. In the first instance Gemini will be implementing CP/M-86.

The GM888 board is based on the 8MHz version of the 8088 CPU, and it is interfaced to the 4MHz 80-BUS via a 'state-machine'. This interface maps the 8088 control signals to Z80 equivalents so that the board may be used with the existing Gemini MultiBoard range. The effective CPU clock rate of the 8088 is slowed by the need to carry out this signal conversion, and the need to carry out dynamic RAM refresh cycles. However, the implementation makes use of any idle cycles of the 8088 Bus Interface Unit (BIU) in order to reduce the refresh overhead. The apparent CPU clock-rate depends upon the exact mix of program instructions executing - it must be remembered that the 8088 and 8087 clock rates remain at 8MHz, it is only the memory read/write cycles that will be slowed. CPU bound instructions, such as the multiply instruction, still execute at the full clock rate, and as instructions are 'pipelined' by the BIU a percentage of wait states do not affect the execution speed of programs. Thus an apparent overall CPU clock-rate of approximately 6MHz is achieved, comparing very favourably with the 4.77MHz rate of the IBM PC.

The on-board battery-backed Real Time Clock provides time and date information which may be used by certain operating systems. It also provides regular interrupts, which may be utilised by Concurrent CP/M for task switching, and a small area of battery-backed memory, which may be used to hold system configuration information.

The addition of this board to a Gemini MultiBoard system will allow the user to run both existing CP/M-80 applications programs as well as software written for the 16-bit operating systems already mentioned (as they are implemented).

Gemini Microcomputers Ltd reserves the right to change any of the above specifications without notice.

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Hardware

The Gemini GM888 hardware configuration provides:

- * 8" x 8" 80-BUS compatible board
- * 8MHz 8088 processor running in maximum mode
- * Can directly address 512 Kbytes of 80-BUS memory
- * I/O port control to switch between 8088 and the host system's Z80
- * Includes Real Time Clock with on-board scratchpad RAM and battery backup (this is accessible by both the 8088 and the host Z80)
- * Z80-like interface to the 80-BUS to support existing Gemini MultiBoards
- * Provision for 8087 arithmetic co-processor

Software

The GM888 hardware allows the possible implementation of the following operating systems:

- * CP/M-86
- * Concurrent DOS (also known as Concurrent CP/M)
- * MS-DOS
- * UCSD
- * Custom user software

Application

The addition of a GM888 board to a Gemini MultiBoard system provides:

- * 16 bit expansion for 80-BUS user
- * Dual 8 bit/16 bit environment
- * Minimal upgrade cost consistent with a good level of performance
- * A level of IBM PC compatibility - 8088 processor, and the ability to read IBM PC CP/M-86 disks.
- * Faster processing capability than the IBM PC

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